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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,618	10/29/2003	James O'Neil	200312535-1	7287
22879	7590	12/12/2007		
HEWLETT PACKARD COMPANY			EXAMINER	
P O BOX 272400, 3404 E. HARMONY ROAD			MCDONALD, RODNEY GLENN	
INTELLECTUAL PROPERTY ADMINISTRATION				
FORT COLLINS, CO 80527-2400			ART UNIT	PAPER NUMBER
			1795	
			NOTIFICATION DATE	DELIVERY MODE
			12/12/2007	ELECTRONIC

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mkraft@hp.com  
ipa.mail@hp.com



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/697,618  
Filing Date: October 29, 2003  
Appellant(s): O'NEIL ET AL.

**MAILED**  
**DEC 12 2007**  
**GROUP 1700**

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Steven Nichols  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed September 7, 2007 appealing from the Office action mailed May 18, 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,395,704	Barnett et al.	5-1995
6,668,207	Montcalm et al.	12-2003
63-195263	Ueda	8-1998

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05-021347	Kobayashi	1-1993
6,364,956	Wang et al.	4-2002
5,773,162	Surampudi et al.	6-1998

Tsai et al. "Bias Sputter Deposition of Dense Yttria-Stabilized Zirconia Films on Porous Substrates", J. Electrochem. Soc., Vol. 142, No. 9, September 1995, pp.3084-3087.

(It should be noted that an official English Translation of Ueda and Kobayashi will follow in an additional communication.)

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 5, 6, 9, 15, 16, 20, 21, 24, 31, 32, 34, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Pat. 5,395,704) in view of Montcalm et al. (U.S. Pat. 6,668,207).

Regarding claim 1, Barnett et al. teach a method of forming a thin film fuel cell electrode. (See Abstract) Barnett et al. teach providing a substrate and at least one deposition device. (Column 3 lines 56-68; Column 4 lines 1-38) A film is deposited that has a porous property since the films deposited have densities of from 75% to >85%. (Column 4 lines 62-65) The position of the substrate can be varied by rotating the substrate with respect to the targets. (Column 4 lines 29-33)

Regarding claim 15, Barnett et al. teach providing at least first and second deposition devices. (Column 3 lines 56-68; Column 4 lines 1-38)

Regarding claim 31, Barnett et al. teach utilizing second and third deposition devices. (Column 3 lines 56-68; Column 4 lines 1-38)

Regarding claim 34, the electrode comprises an anode. (Column 5 lines 37-57)

Regarding claim 35, the anode can be Ni-YSZ. (Column 5 lines 50-53)

Regarding claim 36, the electrode comprises a cathode. (Column 5 lines 37-57)

The differences between Barnett et al. and the present claims is that the deposition characteristic profile for the film is not discussed (Claim 1), varying the relative position of the substrate with respect to at least one axis in order to achieve the deposition characteristic profile is not discussed (Claim 1), the varying of the power is not discussed (Claims 2, 16), advancing the substrate along a substrate advancement path is not discussed (Claims 5, 20), varying the speed is of the substrate is not

discussed (Claims 6, 21, 32) and traversing the substrate back and forth is not discussed (Claims 9, 24).

Regarding the deposition characteristic profile for the film and varying the relative position of the substrate with respect to at least one axis in order to achieve the deposition characteristic profile (Claim 1), Montcalm teach a method for achieving a selected thickness profile and varying the relative position of the substrate to at least one axis in order to achieve a deposition characteristic profile by controlling the velocity and spinning the substrate as the substrate sweeps across the source. (See Abstract; Column 7 lines 8-15; Column 7 lines 46-51)

Regarding claim 2, 16, Montcalm teach controlling the power to control the desired thickness profile. (Column 7 lines 8-15)

Regarding claims 5, 20, Montcalm teach advancing the substrate along a substrate advancement path. (Column 7 lines 37-45)

Regarding claims 6, 21, 32, Montcalm teach that the speed of the substrate can be varied to control the thickness profile. (Column 7 lines 8-15)

Regarding claims 9, 24, Montcalm teach that the substrate can be traversed back and forth. (Column 7 lines 37-39)

The motivation for utilizing the features of Montcalm is that it allows for producing highly uniform films. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Barnett et al. by utilizing the features of Montcalm et al. because it allows for producing uniform films.

Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. in view of Montcalm et al. as applied to claims 1, 2, 5, 6, 9, 15, 16, 20, 21, 24, 31, 32, 34, 35 and 36 above, and further in view of Tsai et al. "Bias sputtered deposition of dense Yttria-Stabilized Zirconia Films on Porous Substrates", J. Electrochem. Soc., Vol. 142, No. 9, September 1995 pp. 3084-3087.

The difference not yet discussed is the varying of the bias to the substrate.

(Claims 3, 17)

Regarding claims 3 and 17, Tsai et al. teach controlling the bias of the substrate during deposition in order to control the structure of the film. (See Abstract; Page 3085)

The motivation for utilizing the features of Tsai et al. is that it allows for controlling the structure of the film. (Page 3085)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Tsai et al. because it allows for controlling the structure of the film.

Claims 4 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. in view of Montcalm et al. as applied to claims 1, 2, 5, 6, 9, 15, 16, 20, 21, 24, 31, 32, 34, 35 and 36 above, and further in view of Ueda (Japan 63-195263).

The difference not yet discussed is the varying of the magnetic field. (Claims 4, 19)

Regarding claims 4, 19, Ueda teach utilizing a varying magnetic flux density during deposition to obtain a homogenous thin film. (See Abstract)

The motivation for utilizing the features of Ueda is that it allows for achieving a homogenous thin film. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Ueda because it allows for achieving a homogenous thin film.

Claims 7, 8, 10, 11, 18, 22, 25, 26, 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. in view of Montcalm et al. as applied to claims 1, 2, 5, 6, 9, 15, 16, 20, 21, 24, 31, 32, 34, 35 and 36 above, and further in view of Kobayashi (Japan 05-021347).

The difference not yet discussed is the varying of the distance (Claims 7, 18, 22, 30), the varying of the speed (Claim 8), varying the distance in multiple directions is not discussed (Claims 10, 25), varying the speed is not discussed (Claims 11, 26) and varying the substrate advancement path is not discussed (Claim 33).

Regarding claims 7, 18, 22, 30, Kobayashi et al. teach varying the distance between the deposition source and the substrate so that the composition of the film can be the same as when the film was first deposited. (See Abstract)

Regarding claim 8, Montcalm already discussed above teach varying the speed of the substrate for depositing a uniform film. (See Montcalm discussed above)

Regarding claims 10, 25, since Montcalm teach rotating the substrate and Kobayashi teach changing the distance between substrate and deposition source the distance is varied in multiple directions between the substrate and the deposition. (i.e.

in the horizontal and vertical directions.) (See Montcalm and Kobayashi discussed above)

Regarding claims 11, 26, Montcalm is discussed above and teach varying the speed of the substrate. (See Montcalm discussed above)

Regarding claim 33, since Montcalm teach rotating the substrate and Kobayashi teach changing the distance between substrate and deposition source the substrate advancement path is varied. (See Montcalm and Kobayashi discussed above)

The motivation for utilizing the features of Kobayashi is that it allows for controlling the composition of the film. (See Kobayashi et al. discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Kobayashi et al. because it allows for controlling the composition of the film.

Claims 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. in view of Montcalm et al. and further in view of Kobayashi et al. as applied to claims 1, 2, 5, 6, 7, 8, 9, 10, 11, 15, 16, 18, 20, 21, 22, 24, 26, 30, 31, 32, 33, 34, 35 and 36 above, and further in view of Wang et al. (U.S. Pat. 6,364,956).

The difference not yet discussed is the use of a shutter (Claim 23).

Regarding claim 23, Wang teach utilizing a shutter to selectively block at least a portion of the a material expelled from at least one of the deposition devices. (See Abstract)

The motivation for utilizing the features of Wang is that it allows for production of a gradient film. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a shutter as taught by Wang because it allows for producing gradient films.

Claim 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. in view of Montcalm et al. as applied to claims 1, 2, 5, 6, 9, 15, 16, 20, 21, 24, 31, 32, 34, 35 and 36 above, and further in view of Surampudi et al. (U.S. Pat. 5,773,162).

The difference not yet discussed is the material of the cathode. (Claim 37)

Regarding claim 37, Surampudi et al. teach that the material for the cathode material of a fuel cell can be sputtered platinum, (Column 12 lines 63-68)

The motivation for utilizing the features of Surampudi et al. is that it allows production of a fuel cell. (Column 12 lines 63-68)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Surampudi et al. because it allows for production of fuel cell.

#### **(10) Response to Argument**

##### ***i.) Response to the arguments of claims 1, 2, 5, 6, 9, 15, 16, 20, 21, 24, 31, 32, and 34-36 as obvious over Barnett in view of Montcalm et al.:***

In response to the argument that Barnett fail to teach controlling the deposition characteristic profile to control desired electrode properties, it is argued that Barnett teach depositing electrodes for a fuel cell while moving the substrate by rotating the substrates. The secondary reference to Montcalm et al. teach a deposition characteristic profile in the form of a deposited thickness profile which is based on the

film property of achieving a uniform thickness. Montcalm et al. achieves this by rotating and controlling the velocity of their substrates. Therefore one of ordinary skill in the art would know from the teachings of Montcalm et al. that the rotating substrates of Barnett would achieve a deposition characteristic profile. This film would have a desired electrode property because Barnett's film is an electrode film. (See Barnett and Montcalm et al. discussed above)

In response to the argument that Montcalm et al. do not teach developing a deposition characteristic profile based on electrode properties, it is argued that while Montcalm et al. teach depositing optical films Montcalm et al. teach controlling rotation of the substrates to deposit films with a deposition characteristic profile. Since the primary reference to Barnett teach rotating substrates and depositing electrode films it would follow from the teachings of Montcalm that Barnett's electrode film will have a deposition characteristic profile. (See Barnett and Montcalm discussed above)

Applicant has additionally argued that the prior art does not teach controlling the film composition, porosity/density and modulation of porosity deposition characteristics. These features are not found in the claims on appeal. In fact such limitations are present in already allowed claims not involved in this appeal.

***ii.) Response to the arguments of claims 3 and 17 as being obvious over Barnett in view of Montcalm and further in view of Tsai et al.:***

In response to the argument that Tsai et al. do not teach varying the bias in accordance with a deposition characteristic profile, it is argued that Tsai et al. teach that varying the bias can control the structure of the film and taken in concert with the

references of Barnett and Montcalm would lead to a deposition characteristic profile. (See Barnett, Montcalm and Tsai et al. discussed above)

***iii.) Response to the arguments of claims 4 and 19 as being obvious over Barnett in view of Montcalm and further in view Ueda:***

In response to the argument that Ueda teach away from the claimed invention because Ueda teach forming a homogenous film which is not desired a deposition characteristic profile for desired electrode properties, it is argued that Ueda do not teach away because a deposition characteristic profile can be one where the film is homogenous throughout. The claims are not limitative to an inhomogeneous film. (See Ueda discussed above)

***iv) Response to the arguments of claims 7, 8, 10, 11, 18, 22, 25, 26, 30 and 33 as obvious over Barnett, Montcalm and Kobayashi:***

In response to the argument that this rejection is traversed for the same reasons as claim 1 is traversed, it is argued that claim 1 is obvious over the cited references discussed above. As such these claims will stand or fall with claim 1.

***v) Response to the argument of claim 23 as obvious over Barnett, Montcalm, Kobayashi and Wang:***

In response to the argument that this rejection is traversed for the same reasons as claim 1 is traversed, it is argued that claim 1 is obvious over the cited references discussed above. As such these claims will stand or fall with claim 1.

***vi) Response to the argument of claim 37 as obvious over Barnett, Montcalm and Surampudi:***

In response to the argument that this rejection is traversed for the same reasons as claim 1 is traversed, it is argued that claim 1 is obvious over the cited references discussed above. As such these claims will stand or fall with claim 1.

**(11) Related Proceeding(s) Appendix**

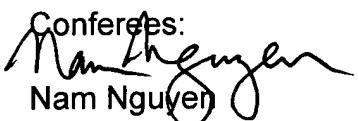
No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Rodney McDonald

Conferees:  
  
Nam Nguyen

  
Romulo Delmendo